



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Brun, Milivoj Konstantin

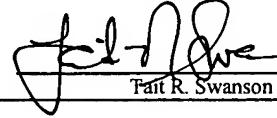
Serial No.: 10/630,148

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For: FIBER COATING METHOD AND
REACTOR

§ Group Art Unit: 1762
§
§
§ Examiner: B. Chen
§
§ Atty. Docket: RD27230-3/SWA
GERD:0616

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October 12, 2006	 Tait R. Swanson
Date	

APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 41.31 AND 41.37

This Appeal Brief is being filed in furtherance to the Notice of Appeal and the Pre-Appeal Brief Request for Review mailed on July 31, 2006, and the Notice of Panel Decision from Pre-Appeal Brief Review subsequently mailed by the Patent Office on September 12, 2006.

The Commissioner is authorized to charge the requisite fee of \$500.00, and any additional fees which may be necessary to advance prosecution of the present application, to Account No. 07-0868; Order No. RD27230-3/SWA (GERD:0616).

1. REAL PARTY IN INTEREST

The real party in interest is General Electric Company, the Assignee of the above-referenced application. Accordingly, General Electric Company will be directly affected by the Board's decision in the pending appeal.

2. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellant's legal representative in this Appeal.

3. STATUS OF CLAIMS

Claims 38-39 are cancelled, and claims 1-27 and 40-45 are currently pending. The pending claims include withdrawn claims 40-45 and finally rejected claims 1-27. Thus, claims 1-27 are the subject of this Appeal.

4. STATUS OF AMENDMENTS

The Appellant has not submitted any amendments subsequent to the Final Office Action mailed on May 31, 2006. Consequently, there are no outstanding amendments to be considered by the Board.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Embodiments of the present invention relate to a method and reactor for applying a coating to a fiber by chemical vapor deposition (CVD). *See Application, page 1, lines 1-2.* More particularly, in certain embodiments, the invention relates to a method of coating a ceramic matrix composite (CMC) fiber that improves uniform coating of the fibers. The Application contains one independent claim, namely, claim 1 that is the subject of this Appeal. The subject matter of this claim is summarized below.

With regard to the aspect of the invention set forth in independent claim 1, discussions of the recited features of claim 1 can be found at least in the below cited locations of the specification and drawings. By way of example, the claimed method of coating a CMC fiber (*e.g.*, 36) includes passing the fiber (*e.g.*, 36) through a reaction zone (*e.g.*, 32) along a path (*e.g.*, 48) substantially parallel to a longitudinal axis of the zone (*e.g.*, 32). The method also includes passing a flow (*e.g.*, 48) of fiber coating reactant through the reaction zone. At least a portion of the flow (*e.g.*, 48) of reactant is disrupted from a path substantially parallel to the fiber path to create a mixing flow adjacent the

fiber (e.g., 36). *See, e.g.*, Application, at page 4, lines 24-27; and page 5, lines 1-13, *see also* FIG. 2.

6. **GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

First Ground of Rejection:

Appellant respectfully urges the Board to review and reverse the Examiner's ground of rejection in which the Examiner rejected claim 1 and dependent claims 2, 4-6, 10-11, 16 under U.S.C. §102(a) as being anticipated by Linn et al. (U.S. Patent No. 6,143,376, hereinafter "Linn").

Second Ground of Rejection:

Appellant also respectfully urges the Board to review and reverse the Examiner's ground of rejection in which the Examiner rejected claims 3, 7-9, 12-15 and 17-27 under U.S.C. §103(a) as being unpatentable over Linn.

Third Ground of Rejection:

Appellant also respectfully urges the Board to review and reverse the Examiner's restriction requirement in which the examiner withdrew claims 40-45, including claim 40 depending from independent claim 1.

7. **ARGUMENT**

As discussed in detail below, the Examiner has improperly rejected the pending claims. Accordingly, Appellant respectfully requests full and favorable consideration by the Board, and reversal of the outstanding rejections. Appellant strongly believes that independent claim 1 and dependent claims are currently in condition for allowance.

A. First Ground of Rejection

The Examiner rejected independent claim 1 and dependent claims 2, 4-6, 10-11, and 16 under 35 U.S.C. § 102(a) as being anticipated by Linn. The Appellant

respectfully urges the Board to reverse this rejection in view of the reasons set forth below.

Legal Precedent

First, the pending claims must be given an interpretation that is reasonable and consistent with the *specification*. *See In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969) (emphasis added); *see also In re Morris*, 127 F.3d 1048, 1054-55, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997); *see also M.P.E.P. §§ 608.01(o)* and 2111. Indeed, the specification is “the primary basis for construing the claims.” *See Phillips v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (*en banc*). One should rely *heavily* on the written description for guidance as to the meaning of the claims. *See id.*

Second, interpretation of the claims must also be consistent with the interpretation that *one of ordinary skill in the art* would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111. “The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.” *See Collegenet, Inc. v. ApplyYourself, Inc.*, No. 04-1202, -1222, 1251, at 8-9 (Fed. Cir. August 2, 2005) (quoting *Phillips*, No. 03-1269, -1286, at 16). The Federal Circuit has made clear that derivation of a claim term must be based on “usage in the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art.” *See id.*

Third, anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984).

Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention “*in as complete detail as contained in the ... claim*” to support a *prima facie* case of anticipation.

Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Fourth, if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (Emphasis Added). The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *Id.* In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.* Regarding functional limitations, the Examiner must evaluate and consider the functional limitation, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. *See* M.P.E.P. § 2173.05(g); *In re Swinehart*, 169 U.S.P.Q. 226, 229 (C.C.P.A. 1971); *In re Schreiber*, 44 U.S.P.Q.2d 1429, 1432 (Fed. Cir. 1997). If the Examiner believes the functional limitation to be inherent in the cited reference, then the Examiner “must provide some evidence or scientific reasoning to establish the reasonableness of the examiner’s belief that the functional limitation is an inherent characteristic of the prior art.” *Ex parte Skinner*, 2 U.S.P.Q.2d 1788, 1789 (Bd. Pat. App. & Inter. 1986).

Features of independent claim 1 missing from Linn reference

Claim 1 recites a method of coating a CMC fiber comprising “passing a flow of fiber coating reactant though said reaction zone; and disrupting at least a portion of said flow of reactant from a path substantially parallel to said fiber path to create a mixing flow adjacent said fiber.” For example, the present application discloses “disrupters 50 force gas to flow 48 through the reactor chamber in a convoluted or turbulent pathway, rather than parallel to the tube axis.” Application, page 5, lines 7-8. By further example, the present application discloses “a plurality of reactant injection inlets 18 intermittently spaced along the longitudinal axis 62 of the chamber” and “directed into the chamber at an angle to the fiber tow 26 to create a turbulent mixing flow adjacent to the tow 26.” Application, FIG. 8; page 7, lines 15-18. Another example disclosed in the present application includes “a set of rollers 64 that convey the fiber tow 26 repeatedly back and forth across the reactor longitudinal axis 62 to interact with the reactant gas flow 48.” Application, FIG. 9, page 7, lines 21-23. Although the Appellant does not suggest or intend that these examples be read into the claims, the Appellant stresses that these examples provide context and meaning to the independent claim 1. Independent claim 1 is merely a generic form of these various examples, e.g., claim 40 and 41.

In the Final Office Action, the Examiner specifically pointed to a citation in the Linn reference, which is reproduced below with emphasis added to relevant portions of the text.

According to the present invention, provision is also made for the short sized fiber bundles to be exposed to a high frequency field in a reactor. When the short fiber bundle enters the high-frequency zone of the reactor, the coating is suddenly decomposed into gaseous products. The resulting gas phase also forces the individual fibers apart. Subsequently, the fibers thus separated are 1) exposed to at least one coating agent present in the gas phase, and 2) CVD coated in the high-frequency field.

The method according to the present invention also makes it possible to coat the cut surfaces of short fibers made by cutting up coated endless fibers. These cut fibers are also CVD-coated in a high frequency field with at least one of the coating agents present in the gas phase. This seals the cut surfaces so that they are unable

to react with the composite matrix and are at the same time protected from oxidation. Linn et al., col. 1 line 64-col. 2 line 11 (emphasis added)

The Linn reference clearly teaches a method of decoating the already coated short fibers and then further coating them using CVD. Linn does not teach or even suggest a method of coating comprising disrupting at least a portion of said flow of reactant from a path substantially parallel to said fiber path to create a mixing flow adjacent said fiber.

Further, Linn specifically recites:

Reactor 30 has an angle of inclination of 45° and a rotational speed n_3 of 5 to 10 rpm. A microwave field is created inside reactor 30. At the same time, reaction gas is introduced into reactor 30 through opening 32, and exits via opening 31. When the fiber bundles enter the microwave zone, the clinging coating (in commercially available fiber bundles) or the clinging matrix (in recyclate fiber bundles) breaks down suddenly into gaseous products, so that the individual fibers are separated from each other. The resulting gas phase forces the individual fibers further apart and exits the reactor. The individual fibers are then CVD-coated by the reaction gas. Reactor 30 is heated by the microwave heater with a homogeneous field and/or by inductive heating. Linn et al., col. 4 line 63- col. 5 line 8 (emphasis added).

Linn specifically teaches the breaking up of short fibers and then subsequently coating the same by CVD using a reaction gas. There is no mention of disrupting the flow of reaction gas to create a mixing flow in the process of coating.

For these reasons, among others, the Linn reference fails to teach or suggest each and every feature recited in claim 1. Hence, the Examiner has failed to establish a *prima facie* case of anticipation.

Features of claim 4 missing from Linn reference

Claim 4 recites, *inter alia*, "said fiber comprises a single monofilament fiber." The Linn reference is clearly missing this feature of claim 4. Linn specifically recites

“Device 1 is used to coat short fibers on all sides from short fiber bundles.” Linn et al, col. 3, lines 36-37. Linn clearly does not teach or suggest a method of coating a single monofilament fiber. For this reason, among others, the Linn reference fails to teach or suggest each and every feature recited in claim 4.

Features of claim 5 missing from Linn reference

Claim 5 recites, *inter alia*, “said fiber comprises a fiber tow. Linn does not teach or suggest a method of coating fibers that are available in tows. In context of the present application, a fiber tow is “pulled on-line through the reactor chamber 32 for chemical vapor deposition of a coating.” Application, page 5, lines 1-2 (emphasis added). For this reason, among others, the Linn reference fails to teach or suggest each and every feature recited in claim 5.

Features of claim 10 missing from Linn reference

Claim 10 recites, *inter alia*, “said fiber coating reactant comprises a hydrocarbon. Linn does not teach a fiber coating reactant including a hydrocarbon. For this reason, among others, the Linn reference fails to teach or suggest each and every feature recited in claim 10.

Hence, the Appellant stresses that the Linn reference does not anticipate independent claim 1 and claims depending thereon, and, thus, the claims are currently in condition for allowance. Appellant respectfully requests withdrawal of the foregoing rejection of independent claim 1 and dependent claims 2, 4-6, 10-11, and 16 under 35 U.S.C. § 102.

B. Second Ground of Rejection

The Examiner rejected dependent claims 3, 7-9, 12-15 and 17-27 under U.S.C. §103(a) as being unpatentable over Linn. The Appellant respectfully urges the Board to reverse this rejection in view of the reasons set forth below.

Legal Precedent

First, the pending claims must be given an interpretation that is reasonable and consistent with the *specification*. *See In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969) (emphasis added); *see also In re Morris*, 127 F.3d 1048, 1054-55, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997); *see also* M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is “the primary basis for construing the claims.” *See Phillips v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (*en banc*). One should rely *heavily* on the written description for guidance as to the meaning of the claims. *See id.*

Second, interpretation of the claims must also be consistent with the interpretation that *one of ordinary skill in the art* would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111. “The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.” *See Collegenet, Inc. v. ApplyYourself, Inc.*, No. 04-1202, -1222, 1251, at 8-9 (Fed. Cir. August 2, 2005) (quoting *Phillips*, No. 03-1269, -1286, at 16). The Federal Circuit has made clear that derivation of a claim term must be based on “usage in the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art.” *See id.*

Third, the burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d. 1430 (Fed. Cir. 1990). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of

reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). The Examiner must provide objective evidence, rather than subjective belief and unknown authority, of the requisite motivation or suggestion to combine or modify the cited references. *In re Lee*, 61 U.S.P.Q.2d. 1430 (Fed. Cir. 2002). Moreover, a statement that the proposed modification would have been “well within the ordinary skill of the art” based on individual knowledge of the claimed elements cannot be relied upon to establish a *prima facie* case of obviousness without some *objective reason to combine* the teachings of the references. *Ex parte Levengood*, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993); *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d. 1313, 1318 (Fed. Cir. 2000); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d. 1161 (Fed. Cir. 1999).

Fourth, when prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). The Federal Circuit has warned that the Examiner must not, “fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.” *In re Dembiczak*, F.3d 994, 999, 50 U.S.P.Q.2d 52 (Fed. Cir. 1999) (quoting *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983)).

Fifth, it is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983); M.P.E.P. § 2145. Moreover, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being

modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959); *see* M.P.E.P. § 2143.01(VI). If the proposed modification or combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *see* M.P.E.P. § 2143.01(V).

Deficiencies of rejection

Claim 12 recites a fiber coating reactant comprising boron trichloride and ammonia. Linn fails to teach or suggest a boron trichloride or ammonia fiber coating reactant.

Similarly, claims 13 and 14 recite a fiber coating reactant including boron trichloride, ammonia, and a silicon precursor. Linn does not teach or suggest such a fiber coating reactant.

Further, claims 22, 23 and 24 recite fiber tows wherein tows are separated at various distances apart. Since Linn does not teach or suggest a method of coating fibers available in tows, the claims are believed to be patentable.

In addition, claims 3, 7-9, 12-15 and 17-27 are all depend on independent claim 1. As discussed in detail above, the Linn reference fails to teach or suggest a number of features set forth in claim 1. Accordingly, these dependent claims are believed to be clearly patentable at least by virtue of their dependency from an allowable base claim.

C. Third Ground of Rejection

In the Final Office Action, the Examiner restricted claims 1-27 and 40-45 to one of two groups: (I) claims 1-27, drawn to a coating method; and (II) claims 40-45, drawn to a method of gas flowing. The Examiner further withdrew claims 40-45 from consideration as being directed to a non-elected invention. The Appellant respectfully

traversed this restriction. First, the Appellant reiterates that claim 40 depends from independent claim 1 and, thus, should be part of group I. The Appellant further stresses that Linn fails to teach or suggest the features of dependent claim 40. Therefore, claim 40 is believed to be in condition for allowance. For example, claim 40 recites “disrupting comprises inducing flow of the fiber coating reactant back and forth across the fiber.” As discussed above with reference to claim 1, this is simply one example of disrupting the flow as recited in claim 1. *See Application, FIGS. 2, 8, and 9.*

In addition, Appellant stresses that claim 41-45 are also directed to coating. The Examiner apparently failed to recognize the recitations of coating and reaction zone in these claims. Independent claim 41 recites, “flowing a fiber coating reactant back and forth across a fiber passing through a reaction zone.” Clearly, claim 41 recites the same “back and forth” language as dependent claim 40. Further, independent claim 45 recites, “flowing a fiber coating reactant crosswise over a continuous fiber at a plurality of locations as the continuous fiber passes through a reaction zone.” Again, this “crosswise” language is similar to the “back and forth” language of claims 40 and 41. For these reasons, among others, the Appellant submits that claims 41-45 should be rejoined with claims 1-27 and 40. In addition, the Appellant stresses that Linn fails to teach or suggest the features of claims 41-45. Therefore, claims 41-45 are believed to be in condition for allowance.

For at least the foregoing reasons, Appellant respectfully requests reversal of the outstanding rejections and allowance of the pending claims.

Conclusion

Appellant respectfully submits that all pending claims are in condition for allowance. However, if the Examiner or Board wishes to resolve any other issues by way of a telephone conference, the Examiner or Board is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

Date: October 12, 2006



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8. **APPENDIX OF CLAIMS ON APPEAL**

1. (original) A method of coating a CMC fiber, comprising:
passing said fiber through a reaction zone along a path substantially parallel to a longitudinal axis of said zone,
passing a flow of fiber coating reactant though said reaction zone; and
disrupting at least a portion of said flow of reactant from a path substantially parallel to said fiber path to create a mixing flow adjacent said fiber.
2. (original) The method of claim 1, wherein said reaction zone is a CVD reactor chamber.
3. (original) The method of claim 2, wherein said fiber is passed through a first seal through said CVD reactor chamber to discharge at a second seal of said reactor chamber.
4. (original) The method of claim 1, wherein said fiber comprises a single monofilament fiber.
5. (original) The method of claim 1, wherein said fiber comprises a fiber tow.
6. (original) The method of claim 5, wherein a plurality of fiber tows are simultaneously passed through said reaction zone for coating.
7. (original) The method of claim 1, wherein said fiber is a silicon carbide fiber.

8. (original) The method of claim 1, wherein said fiber is an aluminum oxide fiber.

9. (original) The method of claim 1, wherein said fiber is a silicon carbide-based fiber.

10. (original) The method of claim 1, wherein said fiber coating reactant comprises a hydrocarbon.

11. (original) The method of claim 1, wherein said fiber coating reactant comprises methane.

12. (original) The method of claim 1, wherein said fiber coating reactant comprises boron trichloride and ammonia.

13. (original) The method of claim 1, wherein said fiber coating reactant comprises boron trichloride, ammonia and a silicon precursor.

14. (original) The method of claim 13, wherein the silicon precursor is selected from dichlorosilane, trichlorosilane, silicon tetrachloride and silane.

15 (original) The method of claim 1, wherein said fiber coating reactant includes hydrogen or nitrogen.

16. (original) The method of claim 1, wherein said reaction zone is maintained at a pressure about 0.05 Torr to about atmospheric pressure (760 Torr).

17 (original) The method of claim 1, wherein said reaction zone is maintained at a pressure about 0.1 to about 50 Torr.

18. (original) The method of claim 1, wherein said reaction zone is maintained at a pressure about 0.3 to about 10 Torr.

19 (original) The method of claim 1, wherein said reaction zone is maintained at temperature of about 700° to about 1800°C.

20. (original) The method of claim 1, wherein said reaction zone is maintained at temperature of about 1100° to about 1550°C.

21. (original) The method of claim 1, wherein said reaction zone is maintained at temperature of about 1350° to about 1500°C.

22. (original) The method of claim 1, wherein a tow of fibers is passed through the reaction zone and the tows are spaced apart about 0.020 to about 1 inch.

23. (previously presented) The method of claim 1, wherein a tow of fibers is passed through the reaction zone and the tows are spaced apart about 0.045 to about 0.25 inches.

24. (original) The method of claim 1, wherein a tow of fibers is passed through the reaction zone and the tows are spaced apart about 0.05 to about 0.1 inch.

25. (original) The method of claim 1, the fiber is passed through the reaction zone at a rate from about 1 to about 200 inches/minute.

26. (previously presented) The method of claim 1, the fiber is passed through the reaction zone at a rate from 5 to about 100 inches/minute.

27. (original) The method of claim 1, the fiber is passed through the reaction zone at a rate from about 10 to about 60 inches/minute.

28.-39. (canceled).

40. (previously presented) The method of claim 1, wherein disrupting comprises inducing flow of the fiber coating reactant back and forth across the fiber.

41. (previously presented) A method, comprising:
flowing a fiber coating reactant back and forth across a fiber passing through a reaction zone.

42. (previously presented) The method of claim 41, wherein flowing the fiber coating reactant comprises deflecting the fiber coating reactant in a zigzagging pattern against opposite walls in the reaction zone.

43. (previously presented) The method of claim 41, wherein flowing the fiber coating reactant comprises passing the fiber coating reactant across a zigzagging pattern of the fiber.

44. (previously presented) The method of claim 41, comprising pulling one or more continuous lengths of the fiber through the reaction zone.

45. (previously presented) A method, comprising:
flowing a fiber coating reactant crosswise over a continuous fiber at a plurality of locations as the continuous fiber passes through a reaction zone.

9. **EVIDENCE APPENDIX**

None.

10. **RELATED PROCEEDINGS APPENDIX**

None.